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The Anhydraemia of Oxalate Poisoning in Horses

by

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On microscopic examination of material from the stomach and intestines of horses that have died from grass sickness, oxalate crystals are observed, as is often the case in similar material from normal horses. Since it is also known that the oxalate content of various weeds is highest at the leafy stage of plant growth, the time of year when grass sickness is most prevalent, experiments were carried out to ascertain whether the symptoms and blood picture of oxalate poisoning in horses resembled those of grass sickness. In this paper the effects of oxalates on the chemical composition of the blood are dealt with. The detailed data obtained with regard to clinical symptoms and the pathology of oxalate poisoning will be published in a later paper.

Oxalic acid and three salts, sodium oxalate, ammonium oxalate and calcium oxalate were used. Each animal was dosed by stomach tube. The effects of large doses and of repeated dosing with smaller doses were investigated. The complete data are given in the following table.

TABLE SHOWING CHANGES IN BLOOD CONSTITUENTS AFTER OXALATE DOSING—VALUES PER 100 ML. OF BLOOD

No. of Horse	Dose		Time of Dosing		Time of Bleeding		Sugar	Hb.	Cl.	Ca.	K	Na.	Total Phos.	N.P.N.
							mg.	g.	mg.	mg.	mg.	mg.	mg.	mg.
38/218	Sodium oxalate	200 g.	24.6.38	11.30 a.m.	24.6.38	12 noon	97·6	15·3	470	12·4	17·5	326	23·9	43·0
	" "	254 g.	24.6.38	3 p.m.	24.6.38	11 p.m.	91·7	14·5	430	8·3	2·0·9	323	21·3	48·0
					25.6.38	11.25 a.m.	80·2	11·0	440	8·1	17·7	333	19·3	48·0
					25.6.38	6.30 p.m.	99·0	10·6	460	10·8	18·0	326	17·9	48·0
					26 6 38	11.20 a.m.	108·1	11·6	46)	12·1	19·4	3 9	21·3	47·0
38/203	Sodium oxalate	454 g.	28.6.38	12.50 p.m.	28.6.38	12.5 p.m.	83·7	8·0	49)	11·5	17·8	319	14·2	28·5
					28.6.38	6.30 p.m.	82·3	7·6	500	8·5	16·7	319	14·0	30·0
					28.6 38	10.0 p.m.	95·7	8·0	510	7·4	2)·3	326	14·2	32·5
	" "	454 g.	29.6.38	2.15 p.m.	29.6 38	2.30 p.m.	88·9	7·9	470	9·0	18·9	333	13·8	41·5
					29.6.38	5.3) p.m.	93·0	9·1	510	8·9	16·4	3 9	15·8	48·0
					29.6 38	11.20 p.m.	109·9	9·3	440	6·3	14·9	323	15·5	57·0
					3).6 38	9.3) a.m.	125·0	9·3	440	5·6	15·1	326	17·2	65·0
					3).6 38	5.20 p.m.	121·2	14·6	450	9·3	33·4	353	19·8	77·5
38/210	Oxalic acid	454 g.	28.6.38	12.3) p.m.	28.6.38	12.5 p.m.	75·2	10·7	46)	12·0	14·5	333	18·3	36·5
					28.6 38	6.45 p m.	85·1	12·9	47)	7·4	15·6	3 9	38·8	56)
					28.6 38	10.0 p.m.	95·2	14·9	46)	6·4	35·9	316	38·8	68·5
	" "	454 g.	29.6.38	12 noon	29 6 38	2.45 p m.	184·4	17·5	46)	3·9	16·1	326	44·4	96)
38/219	Oxalic acid	454 g.	1.7.38	11.5 a.m.	1.7.38	10.50 a.m.	8)·0	10·6	46)	11·7	19·7	341	34·2	33·5
					1.7.38	5 p.m.	85·5	2)·2	38)	5·8	38·0	3)0	3)·3	48)
					1.7.38	8.3) p.m.	1(6·4	21·3	35)	3·2	39·8	366	32·5	57·0
38/211					1.7.38	10.45 a.m.	80.0	10·6	460	11·8	19·4	313	41·2	31· 5
	Oxalic acid	200 g.	1.7.38	11.25 a.m.										
	" "	200 g.	2.7.38	11.30 a.m.										
	" "	200 g.	3.7.38	11 a.m.										
	" "	200 g.	4.7.38	12 noon										
	" "	200 g.	5.7.38	11.15 a.m.										
	" "	200 g.	6.7.38	11 a.m.										
	" "	200 g.	7.7.38	11 a.m.										
	" "	200 g.	8.7.38	11 a.m.										
	" "	200 g.	9 7.38	11 a.m.										
	" "	200 g.	10.7.38	11 a.m.	10.7.38	11 a.m.	104·2	11·9	440	11·7	19·5	3)0	19·6	171·0
	" "	300 g.	11.7.38	12.3) p.m.	11.7.38	12.5 p.m.	83·3	12·9	440	9·7	18·0	3)6	23·8	24)·0
	" "	300 g.	12.7.38	11 a.m.										
	" "	454 g.	12.7.38	4.45 p.m.	12.7.38	6.30 p.m.	96·1	14·6	440	2·9	27·9	323	31·6	266·5
					12.7.38	8.35 p m.	108·1	16·7	430	2·0	43·2	329	34·8	266·5
38/215					1.7.38	10.40 a.m.	80·6	9·5	490	11·5	18·3	323	32·8	30·0
	Ammonium oxalate	200 g.	1.7.38	11.40 a.m.										
	" "	200 g.	2.7.38	11.45 a.m.										
	" "	200 g.	3.7.38	11 a.m.										
	" "	200 g.	4.7.38	12.15 p.m.										
	" "	200 g.	5.7.38	11.25 a.m.	5.7.38	2.45 p.m.	128·2	17·4	440	11·2	24·1	291	23·3	141·0
					5.7.38	5.3) p.m.	127·0	14·5	440	10·7	24·3	333	21·9	150·0
38/216					4.7.38	11.30 a.m.	73·8	11·8	460	12·2	16·5	313	20·8	48·0
	Ammonium oxalate	454 g.	4.7.38	12.30 p.m.										
	" "	454 g.	5.7.38	11.30 a.m.	5.7.38	1.30 p.m.				7·8	21·9	291		
					5.7.38	2.50 p.m.	86·9	24·8	430	5·9	22·9	286	34·6	85·5
38/213					4.7.38	11.30 a.m.	71·4	10·2	460	11·2	15·1	309	19·8	48·0
	Calcium oxalate	454 g.	4.7.38	12.40 p.m.										
	"	454 g.	5.7.38	11.20 a.m.										
	" "	454 g.	6.7.38	12.45 p.m.										
	" "	454 g	7.7.38	11.15 a.m.										
	" "	454 g.	8.7.38	11.15 a.m.										
	" "	454 g.	9.7.38	11.15 a.m.	10.7.38	11.10 a.m.	85·1	10·9	460	11·7	19·5	323	20·0	41·4
38/204					4.7.38	11.15 a.m.	75·5	13·6	450	12·1	17·6	323	22·0	42·5
	Calcium oxalate	200 g.	4.7.38	12.45 p.m.										
	" "	200 g.	5.7.38	11 a.m.										
	" "	200 g.	6.7.38	11 a.m.										
	" "	200 g.	7.7.38	11 a.m.										
	" "	200 g.	8.7.38	11 a.m.										
	" "	200 g.	9.7.38	11 a.m.	10.7.38	11.5 a.m.	103·6	13·5	490	12·8	18·1	313	24·2	36·5

Sodium Oxalate

Horse 38/218 received 454 g. of sodium oxalate in two doses at 3½ hour interval. The animal appeared well and showed no abnormal clinical symptom. The blood picture was normal and no significant change occurred in any of the blood constituents. The haemoglobin value before dosing was very high but returned to a value within the normal range after dosing.

Since 38/218 appeared to be unaffected by the doses given, 38/203 was given larger doses—one of 454 g. sodium oxalate, followed by another of 454 g. 25 hours later. Within a few hours of the first dose tremor of the superficial muscles was observed on the flanks, shoulders and legs with sweating under the tail. After the second dose the tremors increased, the ears drooped and the conjunctivae became congested. The pulse rate increased and seven hours after the second dose reached 105. The symptoms gradually became more severe and the animal died 27 hours after the second dosing. *Post-mortem* examination revealed very little change in the organs.

From the table it will be observed that just before death most of the chemical constituents of the blood showed a significant increase—the haemoglobin rising to 14·6 g., the potassium to 33·4 mg., the sodium to 353 mg., the sugar to 121·2 mg. and the non-protein-nitrogen to 77·5 mg. The N.P.N. showed a gradual rise immediately after the first dose but in the case of the other constituents the rise was not significant till near death. The blood picture is that of an anhydraemia.

Oxalic Acid

Two horses received large doses of oxalic acid and one successive daily doses of smaller amounts. No. 38/210 received 454 g. oxalic acid followed by a second dose of 454 g. 24 hours later. It died within three hours of the second dose. The clinical symptoms which developed were very similar to those of 38/203. The pulse rate rose to 100. On *post-mortem* examination little abnormality was seen in any of the organs. The blood picture was that of an anhydraemia—sugar, haemoglobin, phosphorus, non-protein-nitrogen contents all showing a decided and significant increase even before the second dose was administered. The value for blood non-protein-nitrogen rose very quickly to an exceedingly high value. The fall in the calcium content of the blood was progressive and at the point of death the value 3·2 mg. was exceptionally low. Little change was observed in the sodium and chloride content of the blood.

A very similar picture was obtained in the case of 38/219. This horse received only one dose of 454 g. oxalic acid and died within 12 hours of receiving it. Again the clinical symptoms were very similar to those of 38/203. The pulse rose to a high rate—90—within six hours of receiving the first dose. The horse then became very unsteady on its feet, stumbling and staggering around its box until it died. Very little change was observed in any of the organs on *post-mortem* examination. The blood picture was little different from that of 38/210. The calcium content fell to 3·2 mgs. The chloride content showed a slight decrease. The other main constituents of the blood all showed an increase, especially haemoglobin and non-protein-nitrogen.

Horse 38/211 received a dose of 200 g. oxalic acid for ten successive days and a dose of 300 g. on the eleventh day. No abnormal symptoms developed till the eighth day, when the horse became dull and listless and appeared unsteady on its feet. The prepuce gradually became swollen and by the tenth day was very much enlarged. On the eleventh day the gait was very stiff, and the swelling had extended from the prepuce to the pectoral region; extreme weakness was evident. On the 12th day a dose of 300 g., followed by one of 454 g. six hours later, was administered. Within two hours of the second dose there was much muscular tremor and sweating and the animal died two hours later. The blood picture showed several points of interest. Up till the 12th day the most significant change was a large increase in the non-protein-nitrogen content which reached the exceedingly high value of 240 mg. Within a few hours of the massive doses on the 12th day the calcium content fell quickly to 2·0 mg. whereas the haemoglobin, phosphate and potassium contents of the blood increased to high values. Despite the very high values for non-protein-nitrogen prior to the 12th day the massive doses on that day increased the non-protein-nitrogen content of the blood still further.

Post-mortem examination revealed little change from the normal in any of the organs.

Ammonium Oxalate

Two horses were given ammonium oxalate. No. 38/215 received five daily doses of 200 g. On the morning of the fifth day the horse was down and sweating profusely. On getting to its feet the gait was unsteady and the head was carried in a low hanging position. A blood sample obtained during that period showed that the haemoglobin had risen to 17·4 g. and the non-protein-nitrogen to the very high value of 141 mg. The sugar content of the blood had also increased. The horse was found dead on the morning of the sixth day. On *post-mortem* examination the lesions in the various organs were very similar to those found in the horses which died from administration of oxalic acid and sodium oxalate.

Horse No. 38/216 received 454 g. of ammonium oxalate and a second dose of the same amount 23 hours later. It died within three hours of receiving the second dose. During the last two hours of life there was much diarrhoea. The *post-mortem* examination again revealed little change in the organs. The blood picture was interesting inasmuch as the haemoglobin rose to a very high value—24·8 g.—while the sugar showed only a very slight increase. The calcium content of the blood fell from 12·2 mgs. to 5·9 mgs.—a much greater fall than was evident in 38/215.

Calcium Oxalate

Two horses, 38/204 and 38/213, received calcium oxalate. Horse 38/204 received 200 g. daily and 38/213 454 g. daily for six successive days. No abnormal clinical symptoms were observed in either of these animals. Of the blood constituents only the sugar, which rose slightly, showed any variation from the normal.

Discussion

As was to be expected, the very insoluble calcium oxalate—even in very large doses—produced no change in the blood picture. Neither was any change observed in the horse receiving the smallest dose of oxalate—38/218—although the total amount given equalled 454 grammes. It would appear, therefore, that it is necessary to administer massive doses of oxalates before any effect is seen in horses and in order to produce an immediate effect the dose must be greater than one pound. Thus it is very unlikely that horses under natural conditions of grazing suffer from oxalate poisoning as a result of ingesting plants with a high oxalate content.

The change observed in the blood picture of the horses receiving the massive doses was that of an anhydraemia. In some cases it was very slight, in others quite severe. The anhydraemia was accompanied by a significant fall in the calcium content of the blood, as was to be expected owing to the reaction of oxalate and calcium. From the little change observed in the liver, seen *post mortem*, and from the small increases in the sugar content of the blood, it could be assumed that the liver is not seriously affected by the administration of oxalate since the sugar metabolism does not appear to be upset, the rise in blood sugar being probably due to dehydration.

As some of the clinical symptoms of oxalate poisoning, as described above, bear close similarity to certain of those of grass sickness, it is interesting to find that there are a few differences in the blood pictures of the two conditions. Both blood pictures are those of anhydraemias (Stewart, Gordon and McCallum, 1940) but there are slight differences in the behaviour of the different constituents of the blood. In grass sickness the sugar metabolism obviously is upset—a severe hyperglycaemia being present with values for the blood sugar as high as 400 mg. per 100 c.c. blood being common—whereas in oxalate poisoning the blood sugar showed only slight increases. The calcium content of the blood in grass sickness remains usually within the normal range, slight decreases being observed, whereas in oxalate poisoning the calcium content of the blood falls to an extremely low value. In oxalate poisoning the sodium and chloride contents of the blood do not show a general tendency to fall, although in one case, 38/219, the blood chloride fell from 460 mg. to 350 mg., whereas in grass sickness there is a tendency for both the chloride and sodium contents of the blood to decrease though not always to the same extent. In the light of the above differences in blood picture it may be inferred that the essential pathology of the two conditions is distinct, but if different morbid processes can produce a number of clinical symptoms in common with a number of those of grass sickness, care is necessary in the diagnosing of grass sickness lest in assessing the value of different therapies serious mistakes are made.

Reference

Stewart, J., Gordon, W. S. and McCallum, J. W. (1940.) *Vet. Rec.*, **13**, 237.

Weekly Wisdom

"*Efficiency we must have: excellence we sorely need. Therefore, in every great act of social reconstruction it should be a matter of high concern always to see that we leave room for the exceptional, while we toil at improving the average.*"—Ivor Brown, *The Observer*, December 26th, 1943.

THE VETERINARY RECORD
March 4th, 1944

R.C.V.S. FOUNDATION CENTENARY

ON Wednesday next, March 8th, 1944, falls the centenary of the greatest event in the history of the British veterinary profession, the culmination of the movement which brought about the foundation of the profession by the grant of the Charter of Incorporation of the Royal College of Veterinary Surgeons in 1844.

Among the disabilities inherent in the war-time situation is the virtual impossibility of making adequate preparation for such ceremonial or other celebrations as justly will reflect both the importance of the unique occasion itself and the measure of the desire of members of the Royal College to honour it. In the light of this desire, the Council of the Governing Body is considering suggestions such as the holding of a Centenary Luncheon and the issue of a publication progressively setting forth major steps in our professional progress and portraying the leading figures in the dramatic history of our corporate life. In general, the diverse bodies representing the varied aspects of our professional life have regretfully decided that adequate tribute to the achievements of the R.C.V.S. must be temporarily postponed until the circumstances are more propitious.

Our own procedure in this matter equally has had to be determined by the over-riding pressure of external events. It would normally have been our wish that this issue should carry features, as was the case with our own Jubilee, worthy of that historic part which our professional journalism has played in achieving the liberation of the profession and in wisely directing it onwards to win its Magna Charta. The exercise of this privilege, however, must await the fulfilment of whatever projects the Royal College has in mind, and which themselves must ultimately be determined by the continuance or cessation of chaos in world affairs.

TRAINING RURAL CRAFTSMEN

"A scheme to combat the serious shortage of rural craftsmen, particularly of blacksmiths, is to be put into operation by the counties of Herefordshire, Worcestershire and Gloucestershire," writes a correspondent to *The Farmers' Weekly*. "At the beginning of April the first smith-trainees under a scheme prepared by Herefordshire Rural Industries' Council will start work. The scheme has the wholehearted backing of the County Councils concerned. Bursaries and training with pay are offered to suitable boys.

"The scheme is designed to secure for selected young men a proficiency in smithing equal to that of the best of the existing craftsmen, plus a technical knowledge beyond the standard which the latter have reached. The organisers feel, however, that, although the need for smiths is of great importance to-day, their scheme can —and will—embrace all rural crafts without adaptation."

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H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office.

	Price net s. d.	*Post free* s. d.
COMMAND PAPERS (Session 1943-44):		
[6502.] A National Health Service	1 0	1 2
AGRICULTURE AND FISHERIES, MINISTRY OF:		
Bulletin 7. Scientific Principles of Poultry Feeding by E. T. Halnan, M.A.), 5th Edition, January, 1944 (24-201-7-44*)	1 0	1 2

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Over 25 per cent. of the former wastage of milk in England and Wales through sourage, taint, etc., is now being avoided. This is attributed mainly to the Ministry of Agriculture's testing scheme commenced in June, 1942, and now in operation in every county from Cornwall to Cumberland, and under which the ultimate aim is regular bacteriological testing of all milk supplies from farms.—*Farmers' Weekly.*

ABSTRACTS

[Co-ordinated Trials with Phenothiazine Against Nematodes in Lambs. A report prepared at the instance of the Agricultural Research Council of the United Kingdom. ANON. (1943.) *Imperial Agricultural Bureaux, Joint Publication No.* 4, 56 pp.]

This report deals with the use of phenothiazine as an anthelmintic in sheep. The experiment was conducted at four institutes, at St. Albans, Edinburgh, Cambridge and Weybridge, at the instance of the Agricultural Research Council. The planning of the trials and the statistical analysis of the results were supervised by Professor R. A. Fisher. The purpose of the experiment is explained in the preface: "In view of certain discrepancies in the published reports on the use of phenothiazine as an anthelmintic, and the fact that different criteria have been employed by different workers in assessing its efficacy, the Agricultural Research Council decided to institute a series of co-ordinated trials at several centres, so planned as to give results that would be susceptible of adequate statistical analysis, and would afford answers to certain specific questions." The report comprises four sections, a summary and conclusions, seven appendices, 13 figures (all graphs) and a list of 45 references. The first section is an historical review of some of the published results of other workers on the use of phenothiazine particularly in sheep. Section 2 discusses the general plan of the series of trials and outlines the agreed details of techniques. Section 3 deals with the findings at each of the four centres of experiment, the actual data, weights, egg and worm counts being given in the appendices. In Section 4 the general outcome of the trials, as assessed from the analysis of results, is discussed; the technical details of the various methods of statistical analysis used are set forth in appendices.

In these trials phenothiazine was used in tablet form and as a drench, against roundworms in 280 lambs, which were divided into ten unit flocks of 28 animals, and its effects were measured by lamb weights, egg counts and worm counts. In each unit flock, omitting reserves, four lambs were given 0 (controls), 5, 10, 20, 30, 40 and 50 gm. of the drug. In each batch, excepting the controls, two lambs received the drug as compressed tablets and two as powder made into a drench with water. Each tablet contained 5 gm. phenothiazine and 0·08 gm. sodium cetyl sulphate as a wetting and dispersing agent, and a small amount of starch as a binding agent. In the case of the drench, sodium cetyl sulphate was used in the same ratio as in the tablets. During the experiment four flocks were kept inside for six weeks to avoid re-infestation and then killed for worm counts, while six flocks were kept outside under natural conditions for 16 weeks and weighed at three-weekly intervals. Examination of the data obtained shows that the most marked reduction in egg counts occurred at the lowest dose, namely 5 gm., probably owing to the marked susceptibility of the prolific *Haemonchus*. With most intestinal worms the response was less marked but continued up to the highest dose used. Anomalous responses were obtained from *Strongyloides*, *Trichuris*, *Nematodirus*, and *Moniezia*, the last two actually showing increased counts with higher doses. The sheep parasites are classified in their order of decreasing susceptibility to phenothiazine as follows: *Haemonchus*; *Ostertagia* and *Trichostrongylus axei*; *Cooperia*, *Trichostrongylus* spp. and *Bunostomum*; *Chabertia* and *Oesophagostomum venulosum*; *Strongyloides* and *Trichuris*; *Nematodirus* and *Moniezia*. The evidence of the outside flocks showed that weight increases over 16 weeks were roughly proportional to dosage up to the highest dose used, *i.e.*, 50 gm., the increase averaging 48 times the weight of drug administered. This general impression, that the higher the dose the better the result, indicated that, judging from worm counts from inside sheep, the result must be ascribed to the reduction not merely of stomach worms but also of certain intestinal worms usually considered of little clinical importance and suggests that nematodes other than *Haemonchus* are also involved in preventing normal growth. Both heavily and lightly infested lambs appeared to respond equally well to phenothiazine medication and there was no evidence of any difference in efficacy between tablets and drenches, containing the same weight of drug, beyond a suggestion from the worm counts that drenches may be slightly more efficacious against stomach worms only. J. N. O.

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[Infectious Panleukopenia of Cats. RISER, W. H. (1943.) *N. Amer. Vet.* **24**. 293-299. (13 refs.).]

The results are based on observations of infectious panleukopenia (feline distemper) in 34 cats. After an incubation period of two to nine days there follows a diphasic temperature reaction, the cat becoming markedly ill at the second temperature rise and usually dying a day or so later. Loss of weight and dehydration are constant symptoms, vomiting and diarrhoea occurring in only a proportion of cases. The mortality rate is high. The disease is due to a filtrable

virus and, though transmission is usually by contact, the virus probably remains viable in corporal discharges for several weeks. The macroscopic lesions, which are slight, often include enlarged haemorrhagic mysenteric lymph glands and haemorrhagic enteritis in the region of the ileum. Microscopically, marked proliferation of reticulo-endothelial cells in the lymphatic glands, the disappearance of cell-producing areas in the bone marrow and gross destruction of liver and kidney cells are found, but leukopenia in which the neutrophil cells in particular practically disappear from the blood within four days is the pathognomonic lesion by which it may be differentiated from other diseases with certainty. Specific antiserum is of value provided it is given early, otherwise treatment is symptomatic. Vaccine prepared with formalized tissue appears capable of inducing active immunity. A. W. G.

REVIEW

[**"The Vitamins."** (Published by the Pharmaceutical Society.) Pharmaceutical Press, 17, Bloomsbury Square, London, W.C.1. Price 10s. 6d., post free.]

This handy little booklet will be found invaluable for reference by all those who concern themselves with nutrition in any form in either animals or human beings. It brings up to date and puts in concise, popular language all the information available on the now extensive field of the vitamins.

The terminology of the numerous factors involved, the units of measurement, the chemical and physical properties, the requirements of the human subject and the effects of over-dosage, are all dealt with in separate chapters. In addition, comprehensive tables are included giving the vitamin contents of such commonly used foods as fruits, vegetables, bread and cereals, meat and dairy products. The latter information, which, in itself, is valuable to the housewife, amongst others, is amplified by reference to the effects which cooking has upon the vitamin content. Such knowledge is often lacking in quarters where it is most needed.

Veterinary surgeons, medical practitioners and pharmacists and more enlightened members of the public are more than a little confused by the great variety of proprietary names given to the different vitamin preparations and in order to remedy this, the authors of the booklet have added a full table of the names of the varied preparations on the market together with their composition.

Seldom has so much valuable information been put into such small space.

QUESTIONS IN PARLIAMENT

Ministry of Reconstruction (Scientific Advisers)

Mr. Salt asked the Minister without Portfolio whether it is intended that the Minister of Reconstruction should have a scientific adviser or scientific advisory staff of any kind.

Sir W. Jowitt: No, Sir. It would be wasteful to duplicate the scientific staff of the Departments concerned with particular aspects of reconstruction; and on more general subjects the advice of the Scientific Advisory Committee is available to all the members of the War Cabinet.

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Colonial Development and Welfare Act (Grants)

Mr. Riley asked the Secretary of State for the Colonies (1) the total approximate sum approved for grants for schemes, under the Colonial Development and Welfare Act of 1940, for all the Colonies eligible for grants; and the approximate total amount actually spent on such approved schemes;

(2) The total approximate sum granted for approved schemes under the Colonial Development and Welfare Act of 1940 in the British West Indian Colonies and African Colonies, respectively; and the approximate amount actually spent on such schemes in each case.

Mr. Emrys-Evans: The total commitments under schemes approved under the Colonial Development and Welfare Act to date amount to £7,408,746. Issues in respect of these schemes are £1,300,951. The figure of £7 408,746 also includes schemes amounting to £4,056,591 for the West Indies and £2,046,147 for Africa, for which issues of £638,600 and £447 851 have been made.

Mr. Riley: Does the hon. Gentleman appreciate that under the Colonial Development Welfare Act, 1940, £20,000,000 ought to have been available; and is £4,000,000 in the West Indies satisfactory progress?

Mr. Emrys-Evans: I think if the hon. Member reads the reply he will find that over £4,000,000 have been available to the West Indies.

Sir Alfred Beit: Does not the reply imply that the far greater part of the sum has been earmarked for the West Indies and the African Colonies? Are any amounts being made available to other parts of the Colonial Empire?

Mr. Emrys-Evans: Under Section 4 of the Act a Report with all details will be laid before Parliament as soon after March 31st as possible.

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Animal Breeding (Cyprus)

Replying to Captain Graham, the Secretary of State for the Colonies (Colonel Stanley): Measures taken by the Government to protect the interests of animal breeders in Cyprus are not limited to a single district only but apply throughout the Island. They consist in:—

(1) *Measures for the control of animal diseases.*—All vaccines and medicines for parasitic diseases are distributed free of charge by the Government. Approximately 600,000 animals are vaccinated each year. As examples of the results of this policy the Governor reports that the annual losses from anthrax have been reduced to almost negligible proportions and that the oxen warble fly has been virtually exterminated during the last five years.

(2) *Provision of foodstuffs.*—The Government has assured stock-breeders of supplies of fodder, both locally produced and imported, during the war. Amongst imported foodstuffs cotton seed cake, sesame cake and barley have been distributed to stock-breeders in the form of compound fodder, in some cases at less than cost price.

(3) *Breeding.*—Stud animals are available at the Government Stock Farm at Nicosia and at stud stables elsewhere throughout the Island for improving the local livestock. Selected bulls, jack donkeys and boars are also issued on loan to farmers.

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Sheep Epidemic (Cyprus)

Captain Graham asked the Secretary of State for the Colonies what is the number of sheep killed by the recent epidemic of stomatitis in Cyprus; and what steps are being taken by the Government of Cyprus to stamp out and to prevent a recurrence of this disease.

Mr. Emrys-Evans: I have been asked to reply. 2,500 sheep, representing less than 1 per cent. of the sheep population, were killed by an acute catarrhal fever locally known as stomatitis, but not apparently the disease generally associated with that name. The mode of transmission and means of prevention of this disease are not at present known. No effective preventive or curative treatment has yet been discovered but everything possible is being done to find out the cause of the disease. No new cases have been reported since the middle of January.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Mar. 8th.—Meeting of the Editorial Committee, N.V.M.A., 36, Gordon Square, W.C.1 (future meetings also will be held on the *second* Wednesday of the month).
Mar. 8th, 1944.—**Grant of Charter to R.C.V.S., 1884.**
Mar. 9th.—Meeting of the Lincolnshire and District Division, N.V.M.A. at Peterborough, 2.30 p.m.
Mar. 10th.—Meeting of the Veterinary Sub-committee of U.N.R.R.A., at 1-11, Hay Hill, Berkeley Square, W.1, 2.30 p.m.
Mar. 16th.—N.V.M.A. Committee Meetings at 36, Gordon Square, W.C.1.
Mar. 17th.—**Meeting of Council, N.V.M.A.**, at the London School of Hygiene and Tropical Medicine, W.C.1.
Mar. 29th.—R.C.V.S. Committee Meetings.
Mar. 30th.—**R.C.V.S. Council Meeting.**
April 1st.—R.C.V.S. Annual Fee due.
May 9th.—**R.C.V.S. Council Election.** Last date for receipt of nominations.
May 22nd.—R.C.V.S. Council Election. Voting papers issued.
May 30th.—R.C.V.S. Council Election. Last day for receipt of voting papers.
June 6th.—**R.C.V.S. Annual General Meeting.**
June 7th.—R.C.V.S. Committee Meetings.
June 8th.—**R.C.V.S. Council Meetings.**
June 27th.—R.C.V.S. Examinations begin (provisional date).

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Revision of Control Scheme

As announced in earlier issues, it is proposed in the near future that representatives of the Ministry of Agriculture, the National Veterinary Medical Association and the National Farmers' Union shall meet to review the working of the scheme for the control of certain diseases of dairy cattle. The Association is anxious to receive the views of members on this matter and, in order to assist in the collation and analysis of members' replies, the following questions are suggested; information on any aspect not included, however, will also be appreciated:—

1. Has the control scheme resulted in fuller collaboration in disease control generally ?
2. Has the operation of the control scheme resulted in an increase of professional work on the farm in respect of diseases not included in the scheme ?
3. To what extent has the publicity afforded to the control scheme resulted in an increased demand for the application of control measures outwith the scheme in respect of mastitis, contagious abortion, infertility (including pregnancy diagnosis) and Johne's disease ?
4. In connection with which of the four diseases do you consider the control measures have been most successful ?
5. Please state briefly the reasons which, in your opinion, have contributed to the success or failure of the control scheme.
6. Can you suggest any improvement in the working of the control scheme in general, and particularly as it affects (*a*) the Ministry, (*b*) the practitioner, and (*c*) the farmer.
7. Do you consider that the present scheme could with benefit be extended to include control measures for other diseases and/or other classes of animals ? Is so, state which.

It is hoped that members will endeavour to make their criticisms helpful, whether they be of a constructive or destructive nature.

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PERSONAL

Births.—Scott.—On February 26th, at Bicester Nursing Home, to Jessie, wife of K. N. Scott, M.R.C.V.S., of Bicester, a daughter.

White.—On February 26th, 1944, to Grace, wife of E. G. White. PH.D., M.R.C.V.S., Pendals, Hampstead Norris, Berks, a sister for Patricia.

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Forthcoming Marriage.—Glyn—Wortley.—The engagement is announced between Michael Glyn, M.R.C.V.S., youngest son of Mr. and Mrs. H. D. Glyn, of Balcombe, Sussex, and Ldg.-Wren Christine Wortley, younger daughter of Major and Mrs. W. H. Wortley, of Bungay, Suffolk.

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Death of Dr. G. W. Clough

Our readers will learn with much regret that Professor George W. Clough, D.Sc., of 44, Brookfields, Highgate, passed away on Sunday, February 20th, after a prolonged period of ill health. Dr. Clough, who succeeded the late Dr. Lander in 1920 as Professor of Chemistry and Toxicology at the Royal Veterinary College, London, was not only for many years an eminent teacher of veterinary students, but achieved an international reputation as a chemist, and we hope to pay further tribute to his memory. Our deepest sympathy is extended to Mrs. Clough in her bereavement.

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R.C.V.S. OBITUARY

Comerford, Augustine Ambrose, D.S.O., Lt.-Col. R.A. (T.). Graduated London, December 23rd, 1909. Died February 25th, 1944; aged 58 years.

Sewell, William, Capt. late R.A.V.C., Fairholme, London Road, Uckfield, Sussex. Graduated London, December 23rd, 1909. Died February 23rd, 1944; aged 56 years.

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Allan Hislop McDougall

An Appreciation

Dr. J. McCunn writes:—

There will be many horse men and especially those in the veterinary profession and those connected with the thoroughbred to whom the sudden death of Allan McDougall, recorded in your last issue, will have come as a profound shock. He died on Friday, February 11th. He had been in indifferent health for some time; the recent death of his brother accentuated this and on the last occasion on which I saw him walking over the paddock, I could not help but observe a great change. Here was a man who had earned for himself a high place in the estimation of his fellows. A kindly, unassuming man he was recognised as an authority in his own particular sphere which embraced all matters appertaining to bloodstock. He was a man to whom one could go when in need of advice and help with the certain knowledge that one would not go in vain. His counsel would be backed by many years of unique experience and delivered after due thought and consideration.

He was born at Helensburgh of a long line of veterinary practitioners. He qualified at the London College in July 1910. His eldest brother who died recently and to whom he was greatly attached, followed on in the family practice. Allan set up in Glasgow. He served in the A.V.C. during the last war and was invalided out as a result of acute malaria contracted in India. He resumed his practice in Glasgow and by dint of hard work and ability rebuilt it. He was held in high esteem, especially by the horse and dog clientele.

Mr. McDougall was well known as a judge of Scotties and Cairn terriers. In 1929 he relinquished his practice to join his friend "Jock" Crawford at the British Bloodstock Agency. He took control of the Glasgow Stud Farm at Crews Hill near Enfield. His services were soon in demand in the thoroughbred world and he was recognised as a great authority in equine pregnancy and sterility, and examinations for soundness: a McDougall certificate ranked as a "hall mark." He fitted into the affairs of the Agency and with his fellow directors and the employees made a perfect partnership.

As I grow older I am saddened when such members of our profession are called away. I am sad for personal reasons but also in a wider sense that these great sources of knowledge, true knowledge, based on years of careful observation and practical experience, can be no longer available to those in search of help and advice.

The profession can ill afford to lose men of the calibre of Allan McDougall.

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The Late Dr. C. J. Reakes, C.B.E., M.R.C.V.S.

Dr. Charles John Reakes, whose death at Long Hutt, New Zealand, on October 3rd, 1943, was recorded in our issue of December 25th, was Director-General of the Department of Agriculture, New Zealand, from 1918-1936. The following account of his life and work is extracted from a biographical tribute appearing in the November 15th issue of the *New Zealand Journal of Agriculture.*

The late Dr. Reakes was born in 1865, and graduated from the London Veterinary College in 1892. After some experience in private practice, he came to New Zealand in 1897, and joined the staff of the Department of Agriculture, under the late Dr. J. A. Gilruth, as Government Veterinarian. As a newcomer, he was keen to apply in his adopted country his professional knowledge of the alleviation and prevention of disease in livestock. With unflagging energy he carried out the duties assigned to him, whether they were those of meat inspection or of investigation of disease in the field.

Under the influence of Dr. Gilruth, Dr. Reakes became interested not only in diagnosis and prevention of disease in the field, but also in a continuation of laboratory diagnosis of mortalities. Those were the days when bacteriology was in its infancy. For the benefit of stock, diagnostic work was carried out in a small laboratory established at the headquarters of the Chief Veterinarian, behind the old Parliamentary buildings in Wellington. Dr. Gilruth was also Pathologist to the Health Department, and it was this early training with him that gave Dr. Reakes his grasp of stock diseases in New Zealand. Together with that knowledge he had a manner of dealing with the farmers of the country which throughout his career stood him in such good stead. Always courteous, rarely ruffled, and ever anxious to assist his colleagues and stockowners, Dr. Reakes became a well-known figure throughout the country.

In 1905, a diagnostic and research station for animal disease problems, with a small farm attached, was opened at Wallaceville, and this became the headquarters of the Chief Veterinarian and his first assistant. Dr. Reakes spent long hours in the laboratory in his search for knowledge of the causes of many stock diseases. From 1905 to 1910, in conjunction with Dr. Gilruth he gave New Zealand much new information on diseases such as mastitis, sterility, contagious abortion, bush sickness blackleg, facial eczema and parasites of young animals. This team became broken at the close of 1908, when Dr. Gilruth accepted a position in Australia. Dr. Reakes then became Chief Veterinarian and continued his work with even greater activity. He gained as his laboratory colleague Mr. H. A. Reid, who had had wide bacteriological experience.

Academic Award

The following year, through a reorganisation of the Department, Dr. Reakes became head of a new Livestock and Meat Division, and the following year was awarded the degree of Doctor of Veterinary Science by the Melbourne University, where his excellent work in New Zealand was recognised. Although he was Director of the Division, the Wallaceville Laboratory still remained a haven to Dr. Reakes. There he could get away from administrative worries and enjoy quiet hours discussing the fundamental and practical research in progress.

During the 1914-18 war, Dr. Reakes, as Director of Veterinary Services, was responsible for the buying of horses for the Army, and was in control of the Remount Depots and veterinary hospitals. The shipping of horses to Egypt was another of his cares. Still another was the purchasing of meat and wool for the Imperial Government. It was for his untiring activity and administrative ability during the war years that Dr. Reakes was awarded the C.B.E.

The late Director went to England officially on two occasions. The first visit was for the purpose of gaining a greater knowledge of the meat trade; the second to represent New Zealand at the Empire Agricultural Congress. To senior officials and research workers in England Dr. Reakes was known not only by virtue of his position, but also for his knowledge of diseases of stock under grassland farming conditions.

In 1918 Dr. Reakes became Director-General of the Department of Agriculture, a position he held until his retirement in 1936.

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ROYAL ARMY VETERINARY CORPS

The following announcements are made in recent issues of *The London Gazette*: To be Lts.: William Miller (29771), January 10th, 1944; Michael Robert McCrea (306566), John Binnie McDougall (306567), Brian MacLean (306568), William Morrison Milne (306569), Harold Lucas Pook (306570) January 13th, 1944; John Cruickshanks, B.Sc. (306963), January 24th, 1944.

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FARMING EMPHASIS ON LIVESTOCK

In his recent speech at Taunton, Mr. R. S. Hudson, Minister of Agriculture, said that he hoped all concerned in the recent conflict over prices would turn over the page and concentrate on the task of producing food to win the war and the peace that would follow. He had not been able to promise more than hard labour, worry and grim endeavour for 1944. Neither could he promise them that once this mighty effort had been successfully made they could sit back in restful contemplation of a task accomplished. The stricken peoples of Europe were crying out for food, and food would be short—very short—in the world. British agriculture would not, therefore, be able to ease up, and that was why last summer he had announced a four-year production plan which would carry them up to the harvest of 1947.

One of the greatest shortages of food in the world would be meat and fats. British soil and climate were particularly suited for the production of livestock products, and one of the objectives, therefore, would be to make a gradual change of emphasis from the production of crops for direct human consumption to an increase in livestock and livestock products. More particularly if they were to increase the quality and quantity of their milk supplies all dairy farmers must pay much more attention to breeding policy. He knew that many dairy farmers preferred to keep their own bulls, and for this reason he was anxious to do everything possible to increase the supply of good quality bulls of satisfactory milk recorded ancestry at a reasonable price. During the war they had concentrated particularly on winter milk production. That must go on. But if farmers were to turn over more and more to winter milk production they could not do so on a short-term programme.

He had, therefore, been giving some thought to the likely requirements of milk supplies when the war was over. It was clear that probably for many years the emphasis would still be on winter milk production. He was sure that much more milk could be produced in winter-time than at present, particularly if more farms were properly cropped with this in view. They had already placed most of the price increases on to winter milk, and the margin of difference between summer and winter milk prices was now much higher than it was before the war. The bias was likely to continue, and it was up to each farmer to plan so that he got the maximum winter output, thus taking full advantage of the prices available.

Mr. Hudson said he knew farmers had been worrying about the future. The Government had said they intended to see that a healthy and well-balanced agriculture formed a permanent part of their national economy. The future was in their hands. It was not enough for the farmer to have confidence in the Government. The nation must have confidence too, in the farmer, and the farmer by his conduct had to deserve that confidence. There were solid grounds for saying that British agriculture had now a great opportunity to ensure for itself a better position in relation to other national industries. He believed agriculture in this country could have a great future, but it would only succeed if it could prove both to the nation and to the world that it was efficient and could worthily take its place in the national economy on equal terms with other industries.

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Sir John Russell, in an interview to pressmen in Edinburgh, said that it would take six to eight years to restore the cattle population of Europe, ten to 20 years for horses, six to ten years for sheep, and over six years for hens. He thought that a number of farmers in this country hoped that there would be a considerable market in Europe for breeding animals, but until the food was there to feed them there was no possible use in sending them.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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OPERATION FOR ECTOPIC TESTICLE IN THE BULL

Sir,—It was with considerable interest that I read Professor Formston's criticism of my efforts to render a potentially valuable bull suitable for breeding purposes, but I feel that his letter of February 17th was written in a great hurry and without giving attention to the lack of evidence upon which his statements were based.

In the first place, it is generally believed that the great majority of cryptorchid animals are sterile, and the remainder are usually rendered so by the attention of the veterinarian. Upon what, then, is based the belief that the condition is an inherited factor carried in the male line? Would it not be truer to say that *this belief* is an hereditary factor, as it is passed from generation to generation of veterinary surgeons (in blind faith rather than upon scientific evidence)?

In the second place, I fail to see the relationship between a testicle which fails to descend and one which descends quite normally through the inguinal canal and is then deflected in its course, but *still develops normally*. The exact function of the gubernaculum testis is not fully understood, but it is a cord of tissue which extends from the epididymis to the sub-peritoneal tissue *while the testicle is intra-abdominal*, and it is suggested that it is partially instrumental in the descent of the testicle through the internal ring. I cannot see, then, that it is even reasonable, let alone safe, "to assume that the testicle in this case did not reach the scrotum because of a defective gubernaculum testis." Neither can I agree that the condition of ectopic testicles is necessarily in any way associated with cryptorchidism.

It might be added that this is a condition which is frequently met with by medical practitioners and is treated surgically with good results.

Perhaps Professor Formston's dismay will evaporate as he gives the matter more careful thought.

Yours faithfully,

49, Cambridge Street,
Aylesbury, Bucks.
February 27th, 1944.

L. Guy Anderson.

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THE ONE-PORTAL SYSTEM AND THE COMING R.C.V.S. ELECTIONS

Sir,—The three letters on the subject of the one-portal system of entry, published in your issue of February 12th, have the appearance of a concerted effort to put candidates for election to the R.C.V.S. on the spot. When stripped of their more vague and platitudinous phrases the letters invite candidates to declare perpetual allegiance to the one-portal in its present form. Certainly let us hear their views, but not under any implied threat of being branded traitors.

Admission to the R.C.V.S. does not mark the end of student days. It denotes an act of judgment that the individual has a mind well prepared to respond to experience, the judgment of examiners appointed by Council which is composed of amateurs in the field of education, with a sprinkling of professionals. This is not to criticise the manner in which Council and examiners perform their tasks. It is just plain fact. The inferential question is whether that judgment is necessarily the best that can be exercised. Your correspondents put candidates to the test of saying that it must be so.

There are many who believe that the profession must seek full university status for its colleges or continue to remain largely unrecognised as a scientific body. It is my own view that the need for this remodelling of the preparatory stages far outweighs the importance of the final mode of entry. In return for satisfactory offers to this end I should be prepared to hand over latchkeys to responsible bodies, to bargain with a strong asset while we still have it. The candidate who refuses to examine into the case for such an opinion is no better fitted for Council than is he who would accept it unreasoned.

To look at the other side of the portal, are we entirely satisfied that the R.C.V.S. maintains discipline and affords protection? There is something to be said for the employment of an investigator prepared to examine complaints of unprofessional conduct and of quackery, to seek evidence rather than leave the onus on the individual member.

So I vote for the candidate who realises the problems of the roads up to and beyond the one-portal and not for the man who is willing to offer himself for election merely as a doorkeeper.

Yours faithfully,

110, Reigate Road,
Ewell, Surrey.
February 19th, 1944.

H. T. Matthews.